ABSTRACT OF THE DISCLOSURE

A method is described for distance vector routing of on-demand traffic between routers within an ad-hoc network maintaining multiple loop-free paths to destinations. Each router maintains routing table entries only for destinations associated with data flows through the router which reduce the amount of storage space and bandwidth required for routing table maintenance. Diffusing computations are utilized for establishing and maintaining the routes within the network. The sending of unnecessary flood searches and search-to-infinity problems are avoided, while the protocol decreases the vulnerability of the network to various service attacks along with router failures, fading, and drop outs.